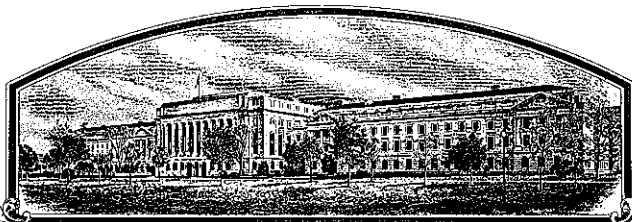


No.



9200168

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Northrup King Co.**

Whereas, THERE HAS BEEN PRESENTED TO THE  
**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'S12-22'

In Testimony Whereof, I have hereunto set  
my hand and caused the seal of the Plant  
Variety Protection Office to be affixed  
at the City of Washington, D.C.  
this 30th day of September in  
the year of our Lord one thousand nine  
hundred and ninety-four.

Attest:

*Kenneth H. Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Mike Esny*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

# APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Northrup King Co.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.	3. VARIETY NAME S12-22
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) P. O. Box 959 Minneapolis, MN 55440		5. PHONE (include area code) 612-593-7333	<b>FOR OFFICIAL USE ONLY</b> VPPO NUMBER 9200168 Filing and Examination Fee: \$ 2,150.00 Date April 29, 1992 Certificate Fee: \$ 250.00 Date Sept. 13, 1994
6. GENUS AND SPECIES NAME Glycine max	7. FAMILY NAME (Botanical) Leguminosae		
8. CROP KIND NAME (Common Name) Soybean	9. DATE OF DETERMINATION September, 1988		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware		12. DATE OF INCORPORATION 1976	

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS  
 Robert W. Romig John Thorne, Ph.D.  
 Northrup King Co.  
 P. O. Box 959-949  
 Minneapolis, MN 55440 Washington, IA 52353  
 FAX: 319-653-4609  
 319-653-2181  
 PHONE (include area code): 612-593-7305

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a. ☒ Exhibit A, Origin and Breeding History of the Variety.

b. ☒ Exhibit B, Novelty Statement.

c. ☒ Exhibit C, Objective Description of Variety.

d. ☐ Exhibit D, Additional Description of Variety.

e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office \_\_\_\_\_

g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)

☐ YES (If "YES," answer items 16 and 17 below) ☒ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☐ YES ☒ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date. \_\_\_\_\_)

☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?

☐ YES (If "YES," give names of countries and dates)

☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [Owner(s)] Robert W. Romig	CAPACITY OR TITLE Vice President Research	DATE April 27, 1992
SIGNATURE OF APPLICANT [Owner(s)]	CAPACITY OR TITLE	DATE

## Origin and Breeding History of the Variety

The soybean variety 'S12-22' is derived from the cross '9240R' x 'Weber'. The cross was made in the summer of 1981 by the Northrup King Co. soybean research staff at Washington, Iowa. The F1 and F2 generations were grown at the Northrup King Co. Research Center at Waimea, Kauai, Hawaii during the winter of 1981-82. The F3 generation was grown at Washington in the summer of 1982; the F4 at Waimea during the winter of 1982-83, and the F5 at Washington in the summer of 1983. The F2-F4 generations were advanced by harvesting 2-4 seeds from each plant and planting a 600 seed sample from the bulk. In the fall of 1983 approximately 100 random plants were harvested and threshed individually. The progeny from these plants were grown in F6 progeny rows in the summer of 1984. One of these, numbered W402985, was selected on the basis of early maturity and agronomic appearance to be tested in a preliminary yield trial in 1985. This line was subsequently tested under the temporary designation X9012 and named S12-22. It has been tested at several northern U.S. and southern Ontario locations from 1986 to 1991 and found to yield well compared to other late Maturity Group 0 and early Group I cultivars. Descriptive traits including white flowers, tawny pubescence, and brown pods have been identified and confirmed. The hilum color genotype is grey with the normal variable phenotype associated with this type. S12-22 has been tested in the field for iron-deficiency chlorosis at test sites in Northern Iowa and Southern Minnesota from 1987 to 1991 and found to be resistant compared to varieties of known reaction. It has been tested for reaction to Phytophthora magasperma using hypocotyl inoculation of greenhouse grown plants and found to be susceptible.

In the winter of 1987-88, 300 seeds of S12-22 were planted at Waimea. At harvest, 100 plants were harvested and threshed individually and their progeny planted at Washington in the summer of 1988 to monitor variability and to produce Pedigree Seed. A few plants with purple flowers or grey pubescence were removed. These plants were assumed to have come from admixture or out-crossing. One row which appeared to be shorter was also removed. The other rows were uniform and were bulked to produce Pedigree Seed. This seed was planted in 1989 to produce Breeder Seed. The increase block was rogued carefully during flowering and at maturity.

Foundation Seed of S12-22 was produced in 1990 and 1991. The Iowa Crop Improvement Association inspected the fields and found them to meet the standards for Foundation Seed. The National Soybean Variety Review Board approved the variety for Certification on December 12, 1991.

S12-22 is a stable and uniform variety except for the variation in hilum color mentioned previously. The hilum color genotype is grey and like other cultivars with this genotype, the color may vary

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from dark grey (which may not be distinguishable from black) to very light grey (which may not be distinguishable from yellow). In seven years of testing and four years of seed increase, no other variants have been observed. Any off-type plants which were removed from increase fields were assumed to have arisen from admixture or outcrossing.

Varietal purity will be maintained using progeny rows as described above as needed.

**EXHIBIT B**

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**Novelty Statement for the Variety**

Soybean variety S12-22 is most similar to Weber and A1937. It can be differentiated from these varieties on the basis of hilum color. Seed of Weber have black hila and seed of A1937 have brown hila, while seed of S12-22 have grey hila.

U.S. DEPARTMENT OF AGRICULTURE  
 AGRICULTURAL MARKETING SERVICE  
 LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
 PLANT VARIETY PROTECTION OFFICE  
 BELTSVILLE, MARYLAND 20705

EXHIBIT C  
 (Soybean)

OBJECTIVE DESCRIPTION OF VARIETY  
 SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Northrup King Co.	TEMPORARY DESIGNATION W402985, X9012	VARIETY NAME S12-22
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) P. O. Box 959 Minneapolis, MN 55440 Attention R. W. Romig		FOR OFFICIAL USE ONLY PVPO NUMBER 9200168

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,  ).

## 1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)  
 3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)  
 4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

## 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow      2 = Green      3 = Brown      4 = Black      5 = Other (Specify) \_\_\_\_\_

## 3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')      2 = Shiny ('Nebsoy'; 'Gasoy 17')

## 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

## 5. HILUM COLOR: (Mature Seed)

1 = Buff      2 = Yellow      3 = Brown      4 = Gray      5 = Imperfect Black      6 = Black      7 = Other (Specify) \_\_\_\_\_  
 Variable expression

## 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow      2 = Green

## 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low      2 = High

## 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1<sup>a</sup>)      2 = Type B (SP1<sup>b</sup>)

## 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')      2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')  
 3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')  
 4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

## 10. LEAFLET SHAPE:

1 = Lanceolate      2 = Oval      3 = Ovate      4 = Other (Specify) \_\_\_\_\_

## 11. LEAFLET SIZE:

☒ 2

1 = Small ('Amsoy 71'; 'A5312')

3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☒ 2

1 = Light Green ('Weber'; 'York')

3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## 13. FLOWER COLOR:

☒ 1

1 = White

2 = Purple

3 = White with purple throat

## 14. POD COLOR:

☒ 2

1 = Tan

2 = Brown

3 = Black

## 15. PLANT PUBESCENCE COLOR:

☒ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☒ 2

1 = Slender ('Essex'; 'Amsoy 71')

3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## 17. PLANT HABIT:

☒ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## 18. MATURITY GROUP:

☒ 4

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

☐Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)☒ 1Bacterial Blight (*Pseudomonas glycinea*)☐Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

☒ 1Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)☐

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐Target Spot (*Corynespora cassicola*)☐Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☒Powdery Mildew (*Microsphaera diffusa*)☒ 1Brown Stem Rot (*Cephalosporium gregatum*)☐Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

## FUNGAL DISEASES: (Continued)

<input checked="" type="checkbox"/> 1	Pod and Stem Blight ( <i>Diaporthe phaseolorum</i> var; <i>sojae</i> )												
<input checked="" type="checkbox"/> 1	Purple Seed Stain ( <i>Cercospora kikuchii</i> )												
<input type="checkbox"/>	Rhizoctonia Root Rot ( <i>Rhizoctonia solani</i> )												
Phytophthora Rot ( <i>Phytophthora megasperma</i> var. <i>sojae</i> )													
<input checked="" type="checkbox"/> 1	Race 1	<input checked="" type="checkbox"/> 1	Race 2	<input checked="" type="checkbox"/> 1	Race 3	<input checked="" type="checkbox"/> 1	Race 4	<input type="checkbox"/>	Race 5	<input type="checkbox"/>	Race 6	<input checked="" type="checkbox"/> 1	Race 7
<input type="checkbox"/>	Race 8	<input type="checkbox"/>	Race 9	<input type="checkbox"/>	Other (Specify) _____								

## VIRAL DISEASES:

<input checked="" type="checkbox"/> 1	Bud Blight (Tobacco Ringspot Virus)
<input type="checkbox"/>	Yellow Mosaic (Bean Yellow Mosaic Virus)
<input type="checkbox"/>	Cowpea Mosaic (Cowpea Chlorotic Virus)
<input type="checkbox"/>	Pod Mottle (Bean Pod Mottle Virus)
<input checked="" type="checkbox"/> 1	Seed Mottle (Soybean Mosaic Virus)

## NEMATODE DISEASES:

Soybean Cyst Nematode ( <i>Heterodera glycines</i> )									
<input type="checkbox"/>	Race 1	<input type="checkbox"/>	Race 2	<input checked="" type="checkbox"/> 1	Race 3	<input checked="" type="checkbox"/> 1	Race 4	<input type="checkbox"/>	Other (Specify) _____
<input type="checkbox"/>	Lance Nematode ( <i>Hoplaimus Colombus</i> )								
<input type="checkbox"/>	Southern Root Knot Nematode ( <i>Meloidogyne incognita</i> )								
<input type="checkbox"/>	Northern Root Knot Nematode ( <i>Meloidogyne Hapla</i> )								
<input type="checkbox"/>	Peanut Root Knot Nematode ( <i>Meloidogyne arenaria</i> )								
<input type="checkbox"/>	Reniform Nematode ( <i>Rotylenchulus reniformis</i> )								
<input type="checkbox"/>	OTHER DISEASE NOT ON FORM (Specify): _____								

## 20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

<input checked="" type="checkbox"/> 2	Iron Chlorosis on Calcareous Soil
<input type="checkbox"/>	Other (Specify) _____

## 21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

<input type="checkbox"/>	Mexican Bean Beetle ( <i>Epilachna varivestis</i> )
<input type="checkbox"/>	Potato Leaf Hopper ( <i>Empoasca fabae</i> )
<input type="checkbox"/>	Other (Specify) _____

## 22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	A1937	Seed Coat Luster	B095
Leaf Shape	S15-50	Seed Size	Hardin
Leaf Color	A1937	Seed Shape	Hardin
Leaf Size	S15-50	Seedling Pigmentation	Weber



## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Submitted	121	2.0	79	4.7	10.1	36.5	23.4	13.8	2-4
Hardin Name of Similar Variety	127	2.6	85	4.5	9.0	37.2	22.6	14.4	2-4

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

**EXHIBIT E****Statement of the Basis of Applicant's Ownership**

Soybean variety S12-22 was developed by the Northrup King Co. soybean breeding staff from germplasm sources cited in Exhibit A of this application. Northrup King Co. believes that the variety is novel as defined in the Plant Variety Protection Act and, therefore, that Northrup King Co. is the sole owner of the variety.